

**Ecosystem Restoration Program  
Interim Science Board  
Summary of February 1st and 2nd Meeting**

**February 1<sup>st</sup>, 2000****Attendance**

ISB Members: Bob Twiss, Ken Cummins, Matt Kondolf, Wim Kimmerer, Michael Healey, Duncan Patten, Bob Spies, Peter Moyle, Dennis Murphy, Paul Angermeier (by phone)  
CALFED staff: Dick Daniel, Wendy Halverson-Martin, Michael Fainter, Rebecca Fawver, Jo Turner, Lauren Hastings

**Communication with Board Members**

To ensure that public communication and access to the Interim Science Board is open, balanced and fair, the ISB and CALFED staff proposed the following procedures:

- The ISB will welcome public comments, and the group prefers that comments be written by letter or by email.
- Comments directed to the ISB should be addressed to the ISB chair Bob Twiss (twiss@regis.berkeley.edu) and should cc: ERP Program Manager Dick Daniel (ddaniel@water.ca.gov). If CALFED staff receive a written comment (letter or email) regarding the ISB with no cc: to the ISB chair, CALFED staff will provide a copy of the communication to the ISB chair. If members of the ISB receive written comment (letter or email) regarding the ISB with no cc: to CALFED staff, the ISB chair will provide a copy of the communication to ERP Program Manager Dick Daniel.
- Any emails that individual ISB members receive regarding the work activities of the ISB should be forwarded to the group email reflector established as workspace for the ISB.
- Any verbal comments made about the ISB by members of the public or CALFED staff at other CALFED meetings will be summarized at the beginning of the next ISB meeting.
- ISB members will relate any verbal comments about the ISB that they have received at the next scheduled ISB meeting.
- CALFED staff agrees to provide a copy of the general comments that have been submitted to CALFED for ISB reference.
- There was no closure on whether CALFED staff would cull public comments about the Strategic Plan received by CALFED.

**ERP Annual Workplan Update**

Michael Fainter provided a brief description of progress on annual workplan activities since the meeting on January 5<sup>th</sup> and 6<sup>th</sup>.

**Scientific White Papers.** Initial drafts of some of the ERP scientific white papers are beginning to be circulated for review. This is not a full-fledged peer review; rather, it is a more collegial review designed to suggest additional important information to include in the white papers, suggest strategies to improve coherence, and to ensure the white papers cover the range of opinion.

White paper drafts circulated for initial review:

- Tidal Wetlands,
- Riparian Habitat and Avifauna,
- Salmonids.

White paper drafts substantially drafted, but not yet circulated for initial review:

- Open Water Processes,
- Contaminants/Aquatic Toxicity.

White paper drafts not yet submitted:

- Fluvial Geomorphology,
- DEFT/EWA,
- Delta Smelt,
- Splittail.

Copies of those white paper drafts circulating for review (Tidal Wetlands, Riparian Habitat and Avifauna, and Salmonids) were provided to individual ISB members prior to the February meeting to potentially inform their work on refining the 12 issues from the Strategic Plan for the FY '01 PSP proposal. Board members who had skimmed these initial drafts (Ken Cummins, Duncan Patten, Mike Healey) said that they were useful for helping to identify particular research questions to include in the PSP as examples of projects to solicit. However, the white papers were received too late by Board members to substantially inform their work in suggesting FY '01 PSP priorities. Ken Cummins said he understood some frustration expressed by others that the white papers were not playing a more central role in defining FY '01 PSP priorities. Michael Fainter and Bob Twiss explained that the two projects were on different timelines: the PSP would need to be distributed in March for project selection to occur before the beginning of FY '01, while the white papers would not be developed sufficiently to provide guidance until later. Wendy Halverson-Martin noted that we have been gradually transitioning the PSP process so that it is increasingly guided by the long-term planning being developed through the ERP, and that FY '01 is still a transition year. The FY '02 PSP will have the benefit of completed white papers to build from.

Duncan Patten asked if the white papers would be completed in time for public circulation to help project proponents developing proposals for the FY '01 PSP. Michael Fainter and Bob Twiss explained that the white papers would not be available for sufficiently wide distribution in time to assist the development of proposals. Each of the white papers is envisioned to go through an expanding cycle of review:

- collegial review of initial drafts by a small number of experts to improve initial drafts;
- expanded review by scientific and technical experts to help ensure they contain key information and cover the range of opinion;
- peer review to improve the quality and scientific foundation of the papers; and,

- more expansive public review.

CALFED staff anticipates that the white papers will not receive sufficient review to serve as guidance documents prior to the May 5<sup>th</sup> deadline for FY '01 proposal submissions.

### **ISB Reference Information**

Ray McDowell provided a brief presentation of the types of spatial information and data sets (maps, GIS coverages) available for the ERP Focus Area. Ray agreed to develop a rough metadata base for ISB reference. Ray McDowell (raymac@water.ca.gov) is the principal contact for mapping and other geospatial information needs. Michael Fainter is the principal contact for print reference material.

### **FY '01 PSP Selection Process**

Rebecca Fawver provided a brief presentation of the FY '01 proposal selection process, which had changed since the January ISB meeting in response to ASET recommendations.

ISB members had several comments and suggestions regarding the different review steps in the proposal selection process.

**Threshold Review.** Wim Kimmerer noted that the local notification requirement for proposals is not applicable for some types of projects, especially those in the estuary, and expressed concern about such projects being screened out during the threshold review.

**Technical Review.** ISB members suggested that project proponents be required to submit potential technical reviewers as part of their proposal.

ISB members agreed to suggest potential technical reviewers to add to the pool from which technical reviewers would be selected.

Board members suggested some alternatives for standardizing payment to technical reviewers, including: (a) pay technical reviewers \$100/hr, and (b) pay technical reviewers \$500 honorarium for each review.

Some Board members suggested that, considering the extensive review that each proposal is projected to receive (threshold, staff, technical, geographic, ASET), selecting two technical reviewers per proposal rather than three may be sufficient and could yield substantial cost savings and reduce the administrative burden.

Board members generally agreed that the 30 days allotted for technical review was sufficient in light of the fact that reviewers would be compensated.

**Geographic Review.** Some Board members expressed concern about the geographical review component of the proposal selection process. Geographic review was seen as a way to get an overview of all projects and review them for a particular region, but the Board was also concerned that geographic review have a science focus and not be a forum for lobbying projects.

**ISB Review.** At the January meeting, the Board decided that it was willing to participate in the proposal selection process by reviewing all scientifically and technically-oriented proposals, but

not ranking them. The Board's comments for each proposal would be forwarded to some other body to rank and select proposals for funding.

The Board revisited how it would participate in the proposal selection process, questioning if the review of all scientific proposals was the best use of Board members' time and talents. The Board decided that it should assume a more "arm's length" role in guiding the ERP, providing conceptual overview and direction rather than becoming ingrained in the nuts and bolts activities such as proposal review. Reviewing all proposals could also nurture the condition or the perception that the ISB is too deeply engaged in the ERP, undermining its status as an independent body. Board review of proposals could also place ERP and CALFED staff in a position of seeming to "veto" ISB recommendations, which would not be good for ERP staff, CALFED, or the ISB. And it was also noted that if the ISB helps to review and/or select proposals, then when the Board later evaluates the overall direction of the ERP, they would in part be evaluating their own work.

The Board generally agreed to the following principles to describe how the ISB would participate in the proposal selection process:

- The ISB as a whole would review the executive summaries of all technically and scientifically oriented proposals, but would not review all full proposals.
- ISB members would have access to all full proposals and examine them at each member's discretion, but would not provide formal review that would be included in the selection process.
- ISB would evaluate the proposals **as a whole** and the overall proposal solicitation process and make suggestions for improving future proposal solicitations. The ISB would help identify topic areas receiving insufficient attention that could serve as potential funding priorities for future PSPs or directed programs.
- The ISB would be available to review full proposals at the request of ASET and/or CALFED staff. Examples of such proposals that may be forwarded for ISB comment include projects that require significant funds to implement or are potentially problematic or contentious. There is some question about the legal implications of the ISB reviewing a subset of proposals rather than all proposals. This issue needs resolution.

**Adaptive Management Review.** The Board suggested adding another step to the review process in which a small group of 2-3 scientists would review proposals and identify those that represent good adaptive management projects. This group could also make suggestions for combining proposals or conditioning proposals to make them into good adaptive management projects. If a promising proposal could not be conditioned sufficiently, then the group could recommend that the proposal be re-tooled as a directed action.

**Directed Programs.** The Board agreed that the FY '01 PSP would generally "raise the scientific bar" compared to previous proposal solicitations, and that it would likely encourage restoration proposals that were more sound and well-reasoned. However, the Board expressed skepticism

that the proposal solicitation process would yield high-quality adaptive management proposals in the near term, since there is little experience or culture for conducting adaptive management, and it will take time to nurture this experience and culture. Board members suggested that directed programs would provide a better opportunity for crafting quality adaptive management proposals. Because of Board members' collective experience in other large-scale restoration programs and other attempts to implement adaptive management, CALFED could better use the Board's time and talent to participate in defining directed programs rather than reviewing or selecting proposals.

### **Refining the 12 Issues**

ERP staff had suggested that the 12 issues identified in the Strategic Plan be used to define more specific proposal categories for the FY '01 PSP. The intent was to define more specific, high-priority issues and questions to better direct the proposals that would be solicited. The Board engaged in a general discussion about the merits of defining more specific categories to better direct proposals. The Board generally understood staff's desire to define more narrow categories as a means of attracting proposals that address important questions for CALFED. But some Board members expressed concern that defining more specific issues and questions could stifle creativity and discourage potential project proponents from submitting creative and innovative proposals. The Board agreed to define more specific subcategories and research questions for each of the 12 issues, but it was left unclear exactly what function the more narrow categories and specific research questions would provide. Would they serve as examples to help guide proposal development, or would they be focussed actions for which proposals would enjoy a competitive advantage over proposals that do not address the identified questions? The Board emphasized that the 12 issues and the research questions defined for each issue should not preclude proposals for projects that address other topics or research questions. All project proponents will be required to articulate a conceptual model to justify the value of the proposed project, and a proposal that addresses an issue or research question outside the scope of the 12 issues—or the research questions defined for each issue—would have the same opportunity for funding.

The Board finished the first meeting day by working to define more specific subcategories for each of the 12 issues and suggesting particular research questions that could serve as examples or priorities for implementation, research, monitoring, and modeling projects.

### **NATURAL FLOW REGIMES.**

Board members and ERP staff developed the following initial list of research questions for the Flow Regime issue/uncertainty:

**Post-Dam Channel Adjustment.** There is a growing acknowledgement that restoring fluvial processes on tributaries regulated by dams must be preceded by an analysis of historical flow conditions, which will help bracket the flows necessary to restore riverine health. But restoring fluvial processes on regulated tributaries must also be preceded by an analysis of channel and

habitat adjustments to the post-dam flow regime. Such analyses will allow resource managers to better balance the projected changes in habitat with the existing habitat value.

**Hydrologic-Biological Flow Mechanisms.** Altered hydrologic conditions have likely helped non-native species gain a competitive advantage over native species, which evolved in the context of a highly variable flow regime characteristic of Central Valley tributaries. However, we do not understand the underlying mechanisms related to flow that give non-native or native species a competitive advantage.

**Threshold flows.** Geomorphic processes such as bed mobility, bank erosion, and floodplain inundation require threshold flows—minimum flows required to initiate these processes. Also, the relationship between flow magnitudes and geomorphic processes is generally not a linear relationship. We generally have a poor understanding of the minimum flows necessary to initiate geomorphic processes on Central Valley tributaries, and the non-linear relationships between flow and geomorphic processes.

**Riparian Root Growth.** Riparian trees must sink roots to keep pace with declining groundwater tables to survive. We generally have a poor understanding of root growth rates for different species of riparian vegetation native to the Central Valley. Estimates for root growth rates in the scientific literature have generally been developed in areas with different hydrologic regimes than the Central Valley, and the rates do not seem to apply to riparian species native to the Central Valley, which have evolved in the context of more drastic fluctuations in flow and groundwater table elevations. Root growth patterns and rates are also affected by the soil substrate. Developing a better understanding of patterns and rates of root growth for riparian vegetation endemic to the Central Valley can help us to better bracket environmental flow needs and improve the success of riparian re-vegetation projects.

**Flow-temperature relationships.** Water temperature is a critical variable for several species of fish, including listed species such as spring-run chinook salmon, winter-run salmon, and steelhead. Water temperature is affected by many factors on regulated streams, including temperature stratification of reservoir pools, flow releases, weather conditions, channel configurations, and riparian habitat. While there are existing temperature models for some Central Valley tributaries, we do not understand flow-temperature relationships for several regulated tributaries. Developing a better understanding of flow-temperature relationships can help us better bracket environmental flow needs.

**Flow-habitat relationships.** We generally have a poor understanding of what habitat is available and used by different species under what flow conditions. A better understanding of the quantity and quality of habitat available under a range of flow conditions for a range of habitat types would help us to better bracket environmental flow needs.

**Flow-related passage barriers.** Several special-status salmonid species (spring-run chinook, winter-run chinook, steelhead trout) have developed life history strategies that include migrating into the upper canyon reaches of tributaries to hold and spawn. Natural channel features can serve as barriers to migration if there is insufficient flow. Developing a better understanding of the threshold flows required to provide passage past flow-related barriers on regulated tributaries

would help us to better bracket environmental flow needs. Similarly, there can be flow-related passage barriers on both regulated and unregulated tributaries as a function of diversions. Understanding the minimum and the optimal flows necessary to provide passage on Bay-Delta tributaries could help prioritize environmental water purchases or exchange agreements.

## **FLOOD MANAGEMENT AS AN ECOSYSTEM TOOL**

**Reach Preparation.** Utilizing floodplains as part of a flood management strategy can be encouraged or enhanced by activities to acquire and prepare stream reaches for inundation. Such activities can include: the acquisition of floodplain lands to allow inundation; setting back levees to allow inundation; removing bank protection to allow channel migration; and removing or floodproofing structures.

**Conveyance Capacity.** There has been some concern expressed that ecosystem restoration projects—such as riparian re-vegetation and gravel augmentation projects—may affect floodway conveyance by reducing channel capacities and/or increasing channel roughness. However, it is unclear to what extent restoration projects affect peak flows, either positively or negatively. Implementation and/or modeling projects can be structured to examine ways to restore ecological function on tributaries while maintaining or enhancing flood management.

**Flood protection.** Human development along streams can be an impediment to releasing flows capable of restoring ecological function. Developing innovative methods for protecting structures from higher peak flows could reduce this obstacle and enable the release of channel-forming flows.

## **CHANNEL DYNAMICS**

**Sediment Deficits.** Several Bay-Delta tributaries have seen drastic reductions in the amount of sediment available for transport owing to dams that trap all coarse sediments derived from upstream reaches. Developing an understanding of the scale of sediment deficit since dam construction, as well as the sediment transport capacity of the regulated flow regime, would help us better understand the scale of sediment augmentation required to restore this fundamental building block of habitat.

**Nutrient Deficits.** In regulated tributaries, has productivity at the base of the foodweb been affected by less frequent inundation of floodplains?

## **FLOOD BYPASSES AS HABITAT**

**Unique Habitats.** Recent research suggests that more frequent inundation of flood bypasses yields significant ecological and biological benefits. There is some question about whether flood bypasses can serve as models for floodplain restoration and inundation projects, or whether the bypasses constitute unique habitats distinct from natural floodplains.

**Species Inundation Preferences.** Refining our knowledge of how different species respond to the duration of floodplain inundation and the velocity and depth of flows on inundated floodplains could help us better bracket environmental flow needs.

**Flood Bypass Infrastructure.** Identifying and evaluating the structural and/or operational options available for getting water onto floodplains and controlling floodplain inundation could facilitate greater management control for environmental benefit.

**Contribution to Estuarine Foodweb Productivity.** How significant is bypass inundation as a contributor to estuarine foodweb productivity—by serving as a source of carbon and nutrients—relative to in-Delta foodweb sources and processes?

**San Joaquin Bypass.** The development of a flood bypass system for the San Joaquin River could potentially provide both flood management and ecosystem benefits. Potential projects could include studies that evaluate the feasibility of establishing a San Joaquin River bypass, or floodplain acquisitions or easements to facilitate the formation of a bypass.

## BEYOND THE RIPARIAN ZONE

**Wildlife-friendly agriculture/multiple use.** Certain agricultural practices—such as partial harvest of crops and winter flooding—can provide incidental wildlife benefits. It is unclear, however, what multiple land uses are compatible with wildlife use. For example, winter flooding of agricultural fields may provide habitat for migratory birds, but pesticide application or the natural occurrence of trace metals could degrade the value of the habitat and pose a threat to wildlife using the habitat. Research and monitoring that accompanies wildlife-friendly agricultural practices could help develop standards to help clarify what practices and multiple land uses are compatible with targeted wildlife use.

**Species-species interactions.** Developing a better understanding of species interactions could help us design restoration actions with broader species benefits.

**Species-habitat relationships.** Improving our understanding of the habitat conditions and mix of habitat types required by special-status species could help us better prioritize habitat restoration efforts and design habitat restoration projects to fulfill species' needs more effectively.

**Population and Metapopulation responses.** To what extent are species population responses controlled by natural variability and to what extent are they a function of anthropogenic disturbances? Developing a better understanding of the mechanisms underlying population status and trends could help prioritize restoration actions and provide a clearer description of what ecosystem changes are attributable to restoration and management actions in contrast to driving variables.



The Board ran out of time to define sample restoration issues for the other 12 issues/uncertainties. Board members agreed to continue defining priority restoration issues for all 12 issues/uncertainties through follow-up discussion via email.

## **February 2<sup>nd</sup>, 2000**

### **Attendance**

ISB members: Bob Twiss, Ken Cummins, Matt Kondolf, Wim Kimmerer, Peter Moyle, Bob Spies, Dennis Murphy, Duncan Patten  
CALFED staff: Dick Daniel, Wendy Halverson-Martin, Michael Fainter, Rebecca Fawver, Jo Turner, Lauren Hastings.

### **ISB composition**

The Board considered what additional disciplinary expertise would be necessary to ensure the ISB covered major scientific disciplines relevant to the ERP. Board members agreed that the ISB could not represent every discipline relevant to the ERP without the group growing too large and cumbersome. Board membership would have to balance disciplinary coverage with manageable size. It was generally agreed upon that the ISB should target a membership of 11 or 12 members.

There was unanimous agreement that the Board needed a wetlands specialist to round out Board membership, since this is a discipline that is very important to the CALFED ERP.

The Board recommended against recruiting a “non-native and invasive species generalist,” questioning the validity of the concept of a NIS generalist. The Board suggested that each topical expert on the Board would be familiar with the non-native and invasive species relevant to their expertise, and with the addition of a wetlands specialist, the Board could cover the principal exotic species relevant to the ERP. Board members also questioned the need for a resource economist on the ISB, acknowledging the value of economic evaluation, but wondering if the Board was the proper place to inject economic analysis since the ISB would be engaging the ERP at a more conceptual level.

### **ISB-ASET Joint Meeting**

The ISB met with the Agency-Stakeholder Ecosystem Team (ASET) to discuss the general relationship between the two groups and the role of each group in the proposal selection process.

ASET members present: Fred Nichols, Dan Castleberry, Kim Webb, Serge Birk, Pete Rhoads, Tim Ramirez, Diana Jacobs,

### **Proposal Selection Process**

ISB and ASET discussed the need for an individual or a small group to compile and characterize the individual technical reviews that each proposal would receive. Members noted that technical reviews can often differ, so compiling and making sense of different technical reviews can streamline later stages of the review process.

ISB and ASET members discussed the advantages and disadvantages of the proposed geographic review. Some members noted the advantage of engaging local experts who are familiar with ongoing and planned restoration activities, which would allow them to place proposed projects within a larger restoration context and potentially link proposals with other restoration activities. Geographic reviewers might also be able to provide an on-the-ground perspective that may be missing in other levels of review. Some members expressed concern about the geographic review and questioned whether it was necessary. A geographic reviewer's familiarity with local restoration activities and his/her on-the-ground knowledge could skew proposal selection, since s/he would likely be more familiar with certain proposed projects or project proponents. A potential alternative to geographical review would be to require project proponents to couch their proposals within the context of recent, ongoing, and planned restoration activities in the geographic area of their project.

### **Public Meeting**

The ISB held its first meeting with the public to introduce Board members, discuss the Board's mission and objectives, discuss Board activities for the FY '01 PSP, and to solicit feedback from members of the public.

As part of the discussion about the Board's participation in drafting the FY '01 PSP, Wim Kimmerer provided a brief description of conceptual models and explained why they are being emphasized as a proposal requirement in the PSP. He explained that every proposed project is governed by an implicit mental model about the key relationships among ecosystem components or the principal cause-and-effect pathways. Conceptual modeling is the process of making those implicit models explicit by articulating the assumed/posited/hypothesized relationships and pathways. Conceptual models may assume a number of different forms, including simple narrative descriptions, box-and-arrow diagrams, matrices, and graphical diagrams.

Matt Kondolf then explained the importance of project design as a critical component of an adaptive management approach. The structure of a restoration project determines, in large measure, what can be learned from the project. He presented an example of a riparian re-vegetation project to illustrate how a project proponent could consider project design. To survive, riparian trees must sink roots that stay in contact with the groundwater table. Groundwater table elevations generally decline as peak flows recede, so riparian trees must grow roots at a rate fast enough to match the rate of decline in the water table. We generally do not know how quickly riparian tree species endemic to the Central Valley can grow roots. Most references in the literature for root growth rates have been developed in systems with different climate, and they do not seem to match the historical hydrologic conditions in the Bay-Delta—the hydrologic conditions within which endemic riparian tree species evolved. Root growth patterns can be affected by the soil substrate. Research has demonstrated that riparian trees generally sink roots vertically through porous, coarse-grained soils, but spread roots laterally in lenses of finer-grained soil. The patterns of root growth can affect tree survival and vulnerability to scour. Within this context, Matt suggested that a riparian re-vegetation project could be designed so that trees are planted in variable soil substrates, at differing distances from the channel. Designing a project with such spatial, temporal, or treatment variations (with accompanying monitoring) can generally yield more information than a project with a homogenous approach to riparian re-vegetation. While such variations may increase restoration

costs and complicate construction bidding or management , such costs must be considered in light of the information gain that is expected to result, and how this can benefit the success of future riparian re-vegetation plantings.

**Questions and Comments from the public:**

Anitra Pawley noted that the PSP focus on the 12 issues/uncertainties would generally place a higher emphasis upon research, monitoring, and modeling than has occurred in past proposal solicitations, which tended to emphasize implementation-oriented projects. She asked the Board how we could measure progress for research, monitoring, and modeling projects since their benefits are generally more long-term. The Board had no immediate comment on how to measure progress for research and monitoring projects, acknowledging it as a good question. They also pointed out that the intent of the current PSP is not to flip past funding decisions by emphasizing research, monitoring, and modeling at the expense of implementation projects. Rather, the PSP emphasizes the need to make all projects more informative, including implementation projects. Designing, conducting, and monitoring implementation projects as experiments is at the core of adaptive management. The PSP will entertain all types of projects, and Board members encouraged the submission of implementation projects designed as adaptive management experiments.

Anitra Pawley suggested that the FY '01 PSP should not focus exclusively on the 12 issues/uncertainties. Rather, the PSP should emphasize what we do know as well as what we don't know. Board members agreed and said that focusing the PSP on the 12 issues does not preclude the submission or selection of proposals focussed on other topics. Board members suggested that each proposal be held to the same scientific standard, including a conceptual model that justifies the proposed project. So a proposal with a sound conceptual model and rationale for a project, even though it may not address an identified uncertainty or priority, could still be a strong candidate for selection.

Ed Cheslak supported the requirement and use of conceptual models, but he suggested that they would be difficult for many potential proposal submitters to develop since it requires a special way of thinking. He also asked how important the conceptual models would be in ranking proposals, and whether the ISB would consider conceptual models to be wrong. Bob Twiss responded that the ISB would not be ranking or selecting proposals. The Board would be available to review projects that represented large-scale or large budget projects, or projects that were potentially controversial, since the implementation of such projects often are often irreversible, expensive, and have significant consequences. Dennis Murphy also suggested that potential project proponents could partner with organizations more comfortable in developing conceptual models and building a scientific rationale for projects. The Board encouraged such partnerships.

Katie Pye recommended that the FY '01 PSP acknowledge the benefit of support projects that educate and engage the public or track the success of projects, which can be as important as implementation- and research-oriented projects. She also expressed concern that smaller organizations lack appropriate staff to develop the scientific underpinnings of their projects, and recommended that the PSP include examples of conceptual models and that CALFED develop a

way of working with selected proposals to develop their workplan. She also asked if it was better to break larger projects into smaller constituent projects or to bundle them as larger projects. Wendy Halverson-Martin pointed out that the FY '01 PSP would include a funding category for education projects. CALFED and the ISB will also convene a workshop to discuss conceptual model development more fully with potential project proponents prior to the deadline for proposal submissions. Wendy noted that there is no clear answer about whether it is better to submit larger bundled projects or decompose them into smaller, discrete projects.

Jason Peltier commended the formation the ISB to provide independent scientific review and guidance to the ERP, and he suggested that the ISB consider and suggest ways for providing independent scientific review and guidance to the CVPIA, since it deals with the same ecosystem but has not included the same level of public involvement as CALFED. He also said that he accepts the idea that habitat restoration helps restore fish populations, which in turn helps reduce export reductions. But he noted that it is difficult for him to convince his constituency of the benefits of habitat restoration since regulatory actions continue to emphasize pump restrictions and do not seem to credit habitat restoration.

Pete Rhoads commented that the expertise, experience, and stature of ISB members provided the group with an opportunity to improve how science is conducted in the Bay-Delta system. He noted that existing scientific organizations, such as the Interagency Ecological Program (IEP) have not built a tradition of independent review, focusing instead on producing gray literature. He also suggested that regulatory agencies often base their decisions on outdated conceptual models. The ISB could play a significant role in building independent scientific review and conceptual model building into Bay-Delta resource management. He also recommended that the ISB open up its meetings to the public as much as possible, to build and preserve public confidence about the Board's independence and scientific judgment. Board members responded that they looked forward to working with Bay-Delta scientists to enhance Bay-Delta science and to build stronger science-management ties. Bob Twiss responded that the ISB has developed three meeting formats: open public meetings; joint meetings between the ISB and other CALFED groups; and working sessions. Bob noted that all three meeting formats would be essential for the Board to be functional and productive. The Board would open its meetings to the broad public as much as possible, but it would also need to reserve time for work sessions to be able to get work done and fulfill its mission.